

How Indiana University Melvin and Bren Simon Comprehensive Cancer Center is Unlocking Research Breakthroughs with Seamless Access to Research-Ready Data

About IU Simon Comprehensive Cancer Center:

Indiana University Melvin and Bren Simon Comprehensive Cancer Center serves as the central hub for cancer research and education across Indiana University. Over the past three decades, its groundbreaking discoveries have transformed cancer treatment worldwide. Advances in genomics, immunotherapy, bioinformatics, and other scientific disciplines are continuously expanding knowledge on cancer prevention, screening, diagnosis, and survivorship.

The Biospecimen Collection and Banking Core (BC²) is a vital component of the cancer center, and provides comprehensive biospecimen management, supporting cancer research through: collection, storage, distribution, and annotation of more than 80,000 samples. The BC² uses a longitudinal consent protocol to collect samples from patients through the various stages of their cancer treatment. A variety of sample types and processing are handled by the BC² team including: fresh, frozen and fixed tissue: blood and blood products, bone marrow and saliva.

Early Wins:

- 5 data sources and 70 terabytes of data brought into a centralized system, improving searchability and accessibility
- Reduced time to service complex data and sample research requests from **weeks to minutes**
- Gave analysts and researchers full visibility into data from **27,000 patients and 80,000+ samples**
- Rapid launch and implementation, ensuring quick adoption and impact

The Challenge: Streamlining Data Access and Usability for Researchers

Cancer research increasingly relies on multimodal data, including tissue analysis, clinical records, genomic sequencing, and imaging. These diverse datasets provide researchers with a more complete understanding of disease, driving more precise diagnoses and personalized treatments. However, managing and integrating these complex data sources presents significant challenges, including harmonization, quality control, and the need for advanced analytical tools. In addition to the rapidly evolving landscape of cancer research, the BC² team faced a growing volume of requests from the researchers they support—including highly specific inquiries to test precise hypotheses—driving the need for more advanced data management and analysis tools. To better serve researchers and scientists within the cancer center, the Biospecimen Collection and Banking Core (BC²) sought to enhance its data infrastructure by integrating disparate data pipelines and storage systems. To achieve this, they needed a technology solution capable of:

- Managing and interpreting increasingly complex biological sample data as clinical care advances
- Linking genomic data with sample information and clinical annotations to determine clinical significance
- Organizing vast amounts of data into accessible and understandable formats
- Ensuring integration with widely available resources to extend research impact
- Offering an easy to use, researcher-friendly interface to explore data, perform analyses, and share work

The Solution: One Platform, Unified Data Access, Smart Tools for Research

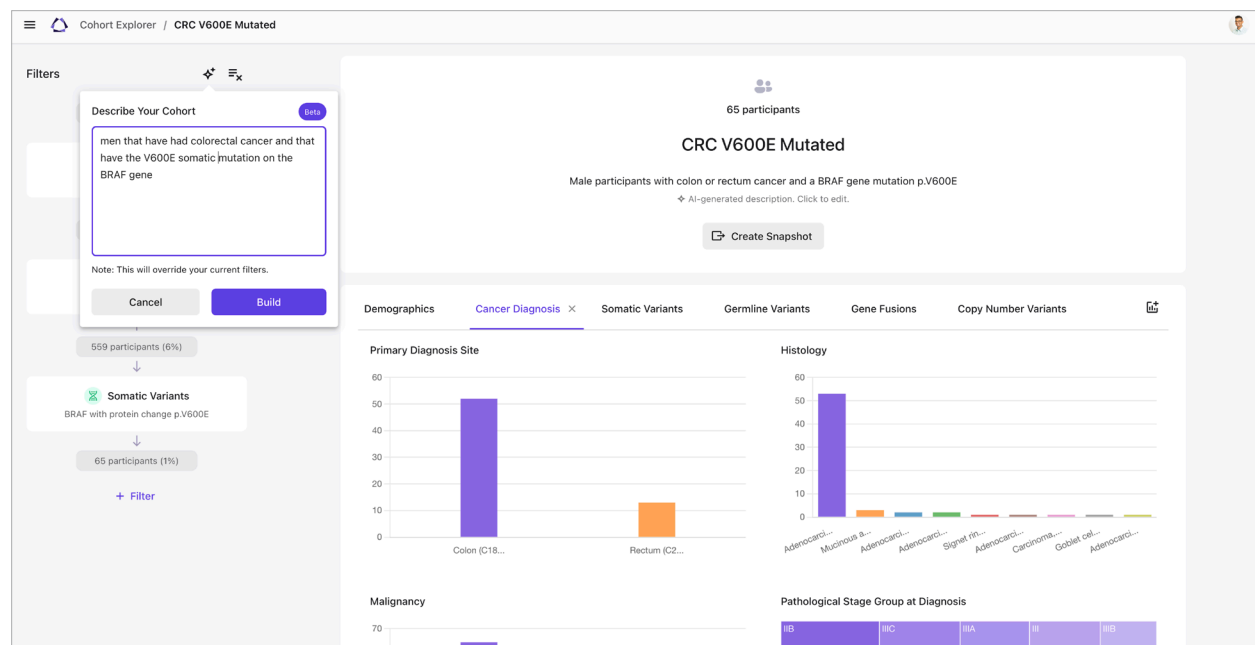
BC² partnered with Manifold to establish a dedicated cancer-specific data system, leveraging Manifold's AI-enabled Trusted Research Environment. The new system ingested, transformed, and harmonized data from multiple sources including REDCap, OnCore, Cancer Registry, OpenSpecimen, and omics data. By centralizing these datasets, and making them more accessible, Manifold and BC² are allowing researchers and analysts to seamlessly browse available data and samples, rapidly build cohorts, and share their work across secure workbenches with ease.

With real-time visibility into biobank inventory—including biospecimens, pre-indexed clinical data, genomic sequencing results, variant calls, and annotations—researchers can quickly determine what data and samples are available to address their questions, eliminating the inefficiencies of fragmented systems.

“Advancements like this are transformative because they remove the technical and logistical barriers that have historically slowed cancer research. By making complex data usable and accessible, we empower more researchers to ask bold questions and accelerate discoveries that directly impact patient lives,” **Dr. Anna Maria Storniolo**, medical director of Biospecimen Collection and Biobanking Core at the IU Simon Comprehensive Cancer Center.

Figure 1. Example Manifold Platform Query Result

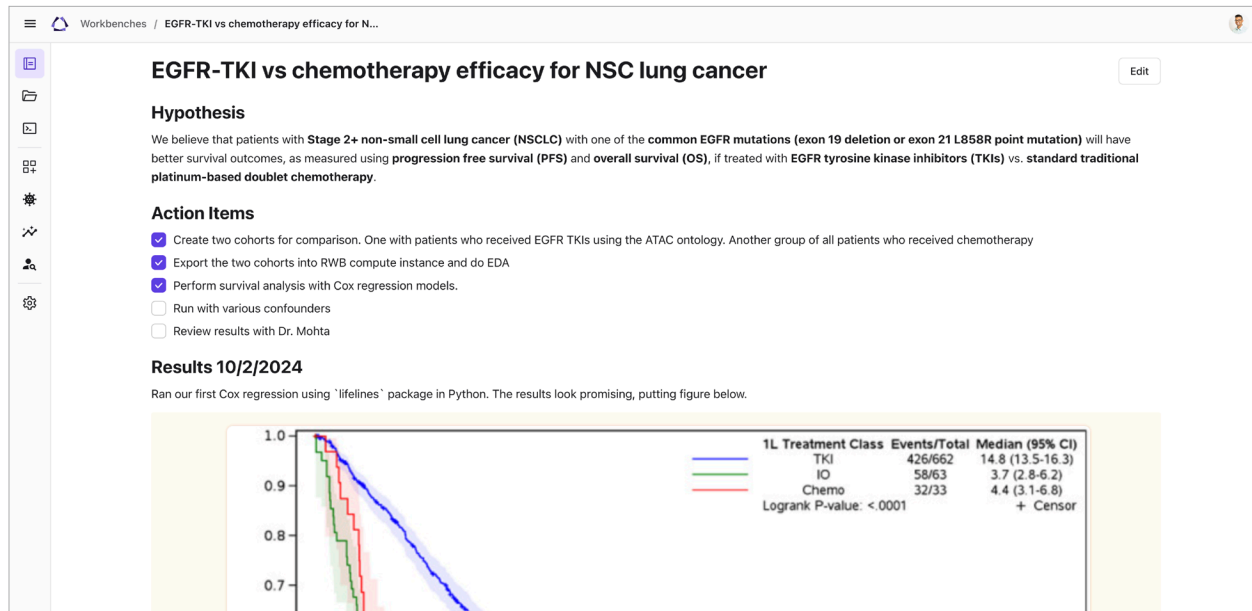
An example of a complex query result in the Manifold platform.
Users can either use filters or natural language to ask complex questions of data.



In addition to the centralization of the data, Manifold's AI-powered **Cohort Explorer** enhances research productivity by allowing users to build cohorts, assess study feasibility, and analyze data through an intuitive natural language interface. Instead of manually sorting through complex datasets, researchers and analysts can describe their analytical needs in plain English, and AI rapidly processes the information to deliver actionable insights. This capability accelerates idea validation and hypothesis testing, driving faster, more impactful cancer research.

Figure2. Example Manifold Workspace

In this example Workspace, a researcher shares hypothesis information, action items, and analysis results on EGFR -TKI vs Chemotherapy efficacy for Non Small Cell lung cancer. with another collaborator.



The platform's collaborative **Workbench** acts as a central hub for researchers to streamline their work, offering an integrated view of key project details such as data, transformations, notes, and comments. Researchers have complete control over their projects, with options to manage private and collaborative workspaces within the same platform. They can assign access permissions and securely share their work with colleagues internally, ensuring seamless and secure collaboration. This enhanced environment will not only improve the flow of research but also foster collaboration by breaking down barriers between teams and departments.

Real Requests BC² Has Serviced Since Launch:

- Identification of treatment-naïve lung adenocarcinoma cases with KEAP1, KRAS, and STK11 mutations
- Retrieval of frozen tissue samples with TP53 mutations
- Rapid filtering of cases with PIK3CA mutations

The Impact: More Discoveries, Fewer Delays

BC²'s investment in the Manifold platform transformed their ability to integrate and utilize complex data from **5 unique sources across their inventory**. This integration provided immediate, full visibility into a previously inaccessible dataset spanning **27,000 patients and 80,000+ samples**—improving both searchability and data access. Both analysts within BC² and researchers across the organization now have access to the full scope of data and samples available for research, enabling them to get answers to feasibility questions faster and accelerate research timelines.

With the system in place, BC² quickly saw measurable benefits in supporting the researchers they collaborate with regularly. The team frequently receives complex data requests that once took weeks to fulfill. For example, a recent request sought “to identify tissue samples harboring a combination of KEAP1, KRAS and/or STK11 mutations from patients with lung adenocarcinoma who

had not yet received chemotherapy at the time of sample acquisition.” Previously, fulfilling such a specific request required manually reviewing hundreds of patient charts. With Manifold’s platform, the process is completed in **minutes rather than weeks**.

*“As precision medicine advances, we need to understand key aspects of other domains. Before, finding how many samples matched specific criteria—like age, cancer biology, genomic markers, and treatment type—could take days or even a week. Now, with this technology, we get answers in minutes.” **Emily Nelson**, data and regulatory team manager and ORIEN program manager, IU Simon Comprehensive Cancer Center.*

Beyond the immediate operational gains, BC² recognized the long-term value of partnering with a technology provider to future-proof their data infrastructure. After nearly two years of developing a similar system in-house, BC² accelerated its progress with Manifold’s collaborative approach, successfully launching the system across the cancer center in half the amount of time to build something in-house. As part of this rollout, BC² and Manifold hosted an open house, inviting researchers from across the organization to experience the platform firsthand. More than 70 users were onboarded, gaining immediate access to data and creating cohorts the same day, with minimal training or set up required.

*“After spending two years trying to build a similar system internally, we quickly saw the difference partnering with Manifold makes. Their expertise had an immediate impact—we’re already ahead of schedule, with capabilities in testing sooner than expected. Their deep domain knowledge meant we could focus on our goals without extensive onboarding, significantly accelerating our progress and delivering results faster than we could have on our own.” **Jeff Johnson**, director of IT research operations for IU Simon Comprehensive Cancer Center.*

Looking ahead, BC² plans to further expand access to the Manifold platform across additional departments within the cancer center including the Komen Tissue Bank at the IU Simon Comprehensive Cancer Center—the world’s only biorepository that collects, stores, and distributes healthy breast tissue and blood samples for cancer research.

*To learn how the Manifold platform can help your organization
contact sales@manifold.ai or visit manifold.ai*